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VERIFICATION OF A TRANSLATION

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Film guide for a movie camera

Description

The invention relates to a film guide for a movie camera as claimed in the preamble of claim 1.

An image window section of an image window is arranged in the optical beam path of the recording objective of the movie camera in order to provide film guidance for movie films in movie cameras, matches the size of the area of the individual images of the movie film to be exposed, and whose film plane is opposite the film plane of a gripper platform and of a spacing window which is integrated in the gripper platform, so that, between the two film planes, a film channel is formed between the image window and the gripper platform, and a film gap is formed between the image window and the spacing window, in order to hold the movie film. The film channel and film gap fix the movie film firmly on an image plane thus ensuring a constant level of contact with respect to the camera objective and thus a constant focusing plane for the movie film during the exposure of the individual images.

The film channel or film gap which is formed between the image window on the one hand and the gripper platform and the spacing window on the other hand is of such a size that, on the one hand, the focusing plane remains constant in the area of the image window section during exposure of the individual images of the movie film and, on the other hand, neither fluttering of the movie film nor increased friction between the movie film and the frame of the image window as well as of the film plane surface of the gripper platform and of the spacing window occurs, which would lead to noise, to damage to the movie film and to increased film transport resistance. In order to minimize the

friction on the movie films during film transport through the film channel and film gap, the gripper platform has side sliding webs on which the normally perforated edge of the movie film slides, and the spacing window has so-called sliding webs which, for example, extend in the movement direction of the movie film and rest against the rear face of the movie film, so that the entire surface of the movie film does not make contact with the spacing window.

DE 85 31 946 U1 discloses a movie film recording camera having guide surfaces which form a film guide channel, via which the film is passed, such that it slides, in feed and take-up areas to and from an image window and in the area of the image window, to be precise between the image window and a film contact-pressure plate. In order to ensure minimal and uniform friction in the film guide channel, and thus easy sliding as well as a minimal load on and damage to the film during film transport, even in the event of major temperature fluctuations, the guide surfaces have a corrugated surface, with the corrugation peaks and corrugation troughs being arranged transversely with respect to the film running direction.

For intermittent film transport, a film transport mechanism is provided in a movie camera and has a gripper switching mechanism which is arranged in a drive module and has one or more gripper tips on a single-sided or double-sided gripper, which engage through elongated opening slots in the gripper platform in the film perforations which are arranged at the side of the film images to be exposed, and transports the movie film onwards by one film image in each case for each film transport step. When the film image is in the stationary phase, at least one blocking gripper engages through a hole in the gripper platform in the film perforation in the movie film, and ensures that the image is stationary while the film is being exposed.

In order to make it easier to insert the movie film into a movie camera, the drive module can be moved or pivoted with respect to the image window together with the spacing window which is supported on the gripper platform of the drive module, so that the film channel between the image window and the gripper platform and the film gap between the image window and the spacing window are enlarged in order to hold the movie film.

The spacing window is connected to the gripper platform via adjusting screws, which support the spacing window on the gripper platform, with the spacing window being sprung with respect to the gripper platform via one or more contact-pressure levers. This results in the size and parallelity of the film gap being ensured via a plurality of moving parts, specifically via the adjusting screws, the springing and the gripper platform which moves with the drive module.

After movement or pivoting of the drive module for insertion of a movie film, this can lead, for example, to the size of the film channel and/or film gap being increased or decreased and to loss of parallelity between the opposite

image planes of the image window and of the spacing window, so that the focusing plane is not ensured in all areas of the film channel and film gap, and/or excessive friction of the movie film occurs.

The object of the present invention is to specify a film guide of the type mentioned in the introduction, in which a constant size, which can be preset, and parallelity are ensured for a film channel and/or film gap which are/is formed between an image window and a gripper platform and/or a spacing window.

According to the invention, this object is achieved by the features of claim 1 or 2.

The solutions according to the invention ensure that a constant parallel film channel and film gap, which can be preset, are maintained between the image window and the gripper platform and/or the spacing window of a movie camera, thus ensuring exact maintenance of a focusing plane on the one hand and of defined friction conditions on the other hand.

The solution according to the invention can be applied both to the film channel which is formed between the image window and the gripper platform and to the film gap which is formed between the image window and the spacing window. In this case, the size and parallelity of the film channel are governed exclusively by the support of the gripper platform on the image window, and the size and parallelity of the film gap are governed by the support of the spacing window on the image window, thus avoiding the dependency of the film channel on the support of the gripper platform by means of undefined contact surfaces on the image window, and the dependency of the film gap, which is formed between the spacing window and the image window, on the sprung connection of the spacing window to the gripper

platform, so that the predetermined size and parallelity either of the film channel or of the film gap or of both the film channel and the film gap are ensured even during movement and/or pivoting of the gripper platform, which is connected to the drive module, for film insertion.

The gripper platform and/or the spacing window are/is preferably supported on at least one contact surface of the image window via a plurality of projections in the form of spacers, with the projections being corner points of a geometric figure.

In one preferred embodiment, the gripper platform and/or the spacing window is or are supported on the at least one contact surface of the image window via three projections, with the first and second projections on the gripper platform and/or on the spacing window being arranged on a side edge of the gripper platform and/or of the spacing window which run/runs parallel to the movement direction of the movie film, and the third projection being arranged on the opposite side edge of the gripper platform and/or of the spacing window, preferably centrally between the first and second projections.

Alternatively, the gripper platform and/or the spacing window can be supported on the at least one contact surface of the image window via in each case one projection, which is preferably in the form of a web or is flat, or can be supported on the at least one contact surface of the image window via in each case at least two projections which are arranged on each side of the gripper platform and/or of the spacing window.

The support of the gripper platform and/or of the spacing window directly on the image window via the projections or webs and in particular via the three projections which are arranged at the corner points of an equilateral triangle results in the size and parallelity of the film channel and/or of the film gap being governed exclusively by the machining, which can be carried out very accurately, of a part of the gripper platform and/or of the spacing window, specifically by means of the projections.

While, if the image window is grooved or is provided with a depression in the film image area, the projections which are arranged on the spacing window are supported on a plane which is stepped from the film plane of the image window, the projections can also be

supported directly on the film plane of the image window by using an image window which does not have grooves or a depression in the central area.

In one preferred embodiment of the solution according to the invention, the spacing window is preferably sprung via a contact-pressure lever with respect to the gripper platform which holds the spacing window and, in particular, is part of a drive module which contains the film transport mechanism.

In order to insert the movie film into the film guide in the movie camera and in order to remove the movie film from the film guide in the movie camera, the

drive module, which is preferably arranged such that it can be pivoted and/or moved in the camera housing, can be designed such that it can be moved and/or pivoted with respect to the image window.

The idea on which the invention is based will be explained in more detail with reference to one exemplary embodiment, which is illustrated in the drawing, in which:

Figure 1 shows a side view of a camera housing of a movie camera with a drive module;

Figure 2 shows a side view of the film guide between an image window and a spacing window which is connected to the drive module;

Figure 3 shows a rear view of the image window gripper platform with the gripper platform and gripper mechanism behind it;

Figure 4 shows a perspective illustration of the image window and spacing window;

Figure 5 shows a perspective illustration of a spacing window with three projections;

Figure 6 shows a section through the view shown in Figure 3, along the line VI-VI;

Figure 7 shows an enlarged illustration of the detail VII shown in Figure 6;

Figure 8 shows a perspective view of the film plane and of the image window, and the rear face of the gripper platform, facing away from the film plane;

Figure 9 shows a perspective view of the film plane of the gripper platform and of the spacing window, and of the rear face of the image window, facing away from the film plane;

Figure 10 shows a view of the film plane of the image window, and the rear face of the gripper platform;

Figure 11 shows a section through the arrangement shown in Figure 10, along the line XI-XI, and

Figure 12 shows an enlarged illustration of the detail XII shown in Figure 11.

Figure 1 shows a side view of a movie camera with a camera housing 1, with a film cassette 9 fitted, and with a film transport mechanism which is in the form of a drive module 2, with the camera door open. The film transport mechanism has a feed device 10 and a take-up device 11 for continuous film transport and in order to form film loops 12, 13 on both sides of an image window section, which is arranged in the recording beam path A, of an image window, and has a gripper mechanism 8 with a film transport motor, by means of which the movie film 3 is transported intermittently in a film guide. In the area of the recording beam path A, the film guide forms a film channel 7 between the image window, which is connected to the camera housing 1, and a gripper platform, which is connected to the drive module 2, of the gripper mechanism 8, which narrows to form a film gap in the area between the image window and the spacing window, which is connected to the gripper platform.

The movie film 3 is moved intermittently by means of the gripper mechanism and is positioned in front of the image window section, which is arranged in the recording beam path A of the image window in order to expose individual film images, with this image window section determining the area of the individual film images to be exposed. The gripper mechanism 8 and with it the gripper platform and the spacing window can be moved or pivoted by operation of a lever 15, so that the film channel 7 and/or the film gap are/is enlarged for insertion of a movie film 3. Once the film has been inserted, the gripper mechanism 8 is pivoted back, thus once again forming the film channel 7 which is intended for film transport, and which, for example when using a movie film with a maximum film thickness of 0.16 mm, is nominally 0.23 mm, while the film gap is nominally 0.175 mm.

Figure 2 shows a side view of the image window 4 and of the gripper mechanism 8 as part of the drive module 2 with a spacing window 6, which is sprung with respect to the gripper platform 5 of the gripper mechanism 8, in a film insertion position, that is to say in a position in which the gripper mechanism 8 has been moved in order to enlarge the film channel 6 and with it the film gap, in order to make it easier to insert the film. Once the film has been inserted, the gripper mechanism 8 is moved or pivoted in the direction of the image window 4 again, thus reproducing the nominally set film channel 6 and film gap.

Figure 3 shows a plan view of the arrangement shown in Figure 2 from the side of the image window 4, with the gripper mechanism 8 located behind it and with the film transport motor 80 of the gripper mechanism 8 as well as the image window section 47 of the image window 4, and sliding webs 64 on the spacing window, which is aligned with the image window section 47.

Figure 4 shows a perspective illustration of the association between the image window 4 and the spacing window 6, which is illustrated in the form of a perspective enlarged view in Figure 5.

In order to ensure a constant and parallel film gap between the image window 4 and the spacing window 6, the spacing window 6 has three projections 61, 62, 63 which are arranged at the side of a contact surface or film plane 60 (Figure 5) of the spacing window 6 with a plurality of sliding webs 64 at the corner points of an equilateral triangle. The projections 61, 62, 63 have associated contact surfaces 41, 42, 43 on the image window 4, which, depending on the embodiment of the image window 4, are arranged on the film plane 40 of the image window 4 or on a plane of the image window 4 which is stepped with respect to the film plane 40, in particular on raised side sliding webs 48, 49.

The arrangement of the projections 61, 62, 63 at the corner points of an equilateral triangle is, however, not essential, and any other desired configuration may also be chosen. Alternatively, two projections, preferably in the form of elongated webs or as surfaces, can be provided on each side of the spacing window 6, or in each case at least two or more projections can be provided on each side of the spacing window 6, with any desired number on both sides, and/or with the same or different intervals and alignments.

Figure 6 shows relationships for the formation of the nominal film gap 70 in the form of a section along the line VI-VI as shown in Figure 3, that is to say with the gripper mechanism 8 having been pivoted back or moved back after insertion of the film.

Figure 7 shows an enlarged illustration of the detail VII from Figure 6 with the image window 4 and the spacing window 6, which is supported by means of the projections 61, 62, 63 on the contact surfaces 41, 42, 43 of the image window 4, with Figure 7 showing the contact between the projection 61 and the contact surface 41. The film plane 40 of the image window 4 forms the front surface of the film gap 70, while the rear surface of the film gap 70 is formed by the film plane 60 of the spacing window 6.

Figure 8 shows a perspective view of the film plane of the image window 4 as well as the rear face of the gripper platform 5 facing away from the film plane. Contact surfaces 41-46 are formed as side bulges on the raised sliding webs 48, 49, which run at the side of the image window section 47 in the longitudinal direction of the image window 4 and along which the perforated edges of the movie film 3 run during film transport, of which the contact surfaces 41, 42, 43 are in the form of contact surfaces for the projections 61, 62, 63 (which are provided as spacers) on the spacing window 6, and the contact surfaces 44, 45, 46 are provided as contact surfaces for the projections 51, 52, 53 (which are provided as spacers) on the gripper platform 5. The contact between the projections 51, 52, 53 on the gripper platform 5 and the contact surfaces 44, 45, 46 of the image window 4 forms a defined film channel, nominally of 0.23 mm, between the image window 4 and the gripper platform 5.

Figure 9 shows a perspective view of the film plane of the gripper platform 5 with the spacing window 6, which is connected in a sprung manner to the gripper platform 5, as well as the rear face of the image window 4, facing away from the film plane, with the image window section 47 arranged in it. The gripper platform 5 has three projections 51, 52, 53 which are arranged approximately at the points of an equilateral triangle, of which the projections 51 and 52 are arranged on one longitudinal side of the gripper platform 5, and the other projection 53 is arranged on the other longitudinal side of the gripper platform 5. During film transport, the projections 51, 52, 53 make contact with the contact surfaces 44, 45, 46 of the image window 4, so that the defined film channel 7 is formed between the gripper platform 5 and the image window 4. At the same time, the projections 61 to 63 on the spacing window 6, which is connected in a sprung manner

to the gripper platform 5, make contact with the contact surfaces 41 to 43 of the image window 4 and form a film gap, nominally of 0.175 mm, on the focusing plane of the movie film.

Figure 10 shows a plan view of the association between the gripper platform 5 and the image window 4 when the image window 4 and the gripper platform 5 are joined together, that is to say in a state after insertion of the film and with the movie camera ready to record films.

The side view shown in Figure 10 shows the contact surfaces 44, 45, 46 (which project at the side of the sliding webs 48, 49 of the image window 4) for holding the projections 51, 52, 53 of the gripper platform 5, which are arranged on one longitudinal side or the other of the gripper

platform 5. In addition, Figure 10 shows a view of the rear face of the spacing window 6, which is pressed in a sprung manner against the gripper platform 5 by means of the contact-pressure lever 16.

Instead of the projections 51, 52, 53 and contact surfaces 44, 45, 46 which are arranged on one longitudinal side or the other of the image window 4 and of the gripper platform 5, it is also possible to provide continuous webs on both sides, or in each case two or more projections and associated contact surfaces on each side, of the gripper platform 5 and of the image window 4.

In a section along the line XI-XI as shown in Figure 10, Figure 11 shows the relationships when the nominal film channel 7 is formed between the gripper platform 4 and the image window 5, with the drive module pivoted back or pushed back, and with the gripper platform 5 attached to it, for example after insertion of the film. The film channel 7 is defined by the contact between the projections 51, 52, 53 as shown in Figure 10, of which the projections 52 and 53 are illustrated in Figure 11, and the contact surfaces 44, 45, 46, of which the contact surfaces 45 and 46 are illustrated in Figure 11.

Figure 12 shows an enlarged illustration of the detail XII shown in Figure 11 with a part of the image window 4 and of the gripper platform 5 in the area in which the gripper platform 5 is supported on the image window 4 via the projection 53 and the contact surface 46, in order to form the defined, nominal film channel 7, for example of 0.23 mm, between the front surface 71, which is formed on the image window 4, and the rear surface 72, which is formed on the gripper platform 5, of the film channel 7.

List of references

1	Camera housing
2	Drive module
3	Movie film
4	Image window
5	Gripper platform
6	Spacing window
7	Film channel
8	Gripper mechanism
9	Film cassette
10	Take-up device
11	Feed device
12, 13	Film loops
15	Lever
16	Contact-pressure lever
40	Film plane of the image window
41-46	Contact surfaces of the image window
47	Image window section
48, 49	Sliding webs of the image window
50	Film plane of the gripper platform
51-53	Projections on the gripper platform
60	Film plane of the spacing window
61-63	Projections on the spacing window
64	Sliding webs
70	Film gap
71	Front surface of the film channel
72	Rear surface of the film channel
80	Film transport motor
A	Recording beam path